

MAXILIN

Scientific Dossier: Origin, Mechanism of Action, and Evidence Base

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About This Document and the Principle of Evidence Separation

This document was prepared from materials supplied about the “Maxilin” product: patent documentation, official clinical instructions, laboratory test protocols, reports on field/production use, an interview with the developer, and a popular-science book about the microbiome. Its purpose is to bring these materials together into a single, logically structured overview and to **clearly separate what type of evidence each statement belongs to**.

In evidence-based medicine, not all sources of information carry equal weight. This dossier therefore consistently applies a principle of **evidence separation**:

1. **Independent scientific publication** — a peer-reviewed article indexed in PubMed, not affiliated with the manufacturer.
2. **Official regulatory and patent documents** — patents, clinical-use instructions approved by pharmacological commissions, protocols from accredited laboratories, trademark registration certificates.
3. **Reports on practical application** — implementation acts, reports from livestock and poultry operations, statements from medical and veterinary institutions.
4. **Historical and personal testimony** — an interview with the scientist behind the product’s development, conveying history, observations, and personal opinion, but not a scientific publication.

Section 14 brings this hierarchy together in a single table.

Important disclaimer. This document is not medical advice and does not replace consultation with a physician or veterinary professional. The dosages and regimens found in historical patent and clinical documents (1970-2006) relate to specific product formulations from that period and should be checked against the current instructions and labeling of today’s product before being relied upon.

1. Historical Background

According to the developers and the materials accompanying the product, the history of “Maxilin” is linked to several strands of 20th-century research.

1.1. Scientific Lineage: From Mechnikov to the Ivanovs

The materials accompanying the product (including an interview with microbiologist Grigory Ivanovich Miroshnikov, one of the patent co-authors) describe “Maxilin” as a continuation of a research line on lactic-acid bacteria and gut microflora spanning more than a century:

- **1908** — Ilya Mechnikov’s Nobel Prize; his work on cellular immunity and his interest in fermented milk, acidophilic bacteria, and longevity are presented in the interview as the intellectual foundation for later research.
- **Ivan Maksimovich Ivanov** — according to G.I. Miroshnikov’s account, an earlier researcher who developed biological preparations and encouraged further study of natural protective microorganisms.
- **Galina Maksimovna Ivanova** — a microbiologist and candidate of biological sciences, daughter of I.M. Ivanov; the interview presents her as the principal scientific lead behind the strain that became the basis of “Maxilin.”
- According to this account, an important catalyst for the project was a scientific conference in Japan around 1980, where the potential development of highly antibiotic-resistant pathogenic microorganisms was discussed; this, per G.M. Ivanova (as relayed in the interview), convinced her of the need to create a natural agent capable of supporting the body’s defenses and directly competing with dangerous microflora.
- The period of intensive development is dated in the interview to **1981 through the late 1980s**: gradual adaptation of the strain to antibiotics while preserving its natural beneficial properties.

A separate source — the “MAXILIN” brochure accompanying the product — states that the preparation’s name derives from the words “**Maximum Strength**” (“Максимальная сила”), and that development took place in the 1980s by a group of biotechnologists and physicians including **A.I. Gulyaev, G.M. Ivanova, and G.I. Miroshnikov**. These same names (Gulyaev A.I. and Miroshnikov G.I.) appear as authors of Kazakhstan patent No. 14850 (see Section 4.2).

How to read this section. The historical portion is based on the manufacturer’s brochure and on a retelling of an interview with one of the developers. It is a valuable historical account from the people involved, but it is not independently verified academic historiography — names, dates, and origin details are presented as the product’s creators themselves describe them.

1.2. Origin of the Culture

Both the patent materials and the promotional materials consistently describe an unusual origin for the original culture: the bacterium was isolated from the **abomasum (true stomach) of a newborn lamb** and from the **meconium** (first stool) of new-

borns — human or piglet, depending on the document. The idea presented in the sources is that such a bacterium naturally occurs in the body during fetal development, protecting the fetus from infection, and is then expelled from the body at birth.

2. Strain Identification and Related Designations

Several related but not always identical strain designations appear across the supplied documents — worth stating plainly rather than smoothing over:

Designation in documents	Source	Origin (per document)
Lactobacillus acidophilus, strain 2585 (also “13 No. VKPM 2585” / “AG/13-2585”)	Kazakhstan patent No. 14850 (Miroshnikov G.I., Gulyaev A.I.); AGMI instructions; KazNMU clinical study; poultry-farm protocols	Deposited in the collection of the All-Union Research Institute of Genetics and Selection of Industrial Microorganisms (VKPM)
Lactobacillus acidophilus-AG/17-666	Eurasian patent No. 014227	Isolated from the meconium of a newborn piglet; held from 1996 in the collection of the Alma-Ata Zooveterinary Institute, now held by LLP “VIRA 2006” under No. 666
“Strain 2585-666”	Opinion of the Kazakhstan Association of Nutritionists, Gastroenterologists, and Endoscopists	Cited as a combined designation for the pure culture of acidophilic lactobacilli used in the current product

Manufacturer materials associate the current “Maxilin” formula with a strain designated **2585** (in the most recent documents, “2585-666”). Patent No. 014227 describes a related but separately deposited strain, AG/17-666, used for a different method of producing a fermented-milk product (with the addition of egg melange).

An honest caveat. The supplied materials do not include modern molecular-genetic analysis (sequencing) that would conclusively establish the taxonomic identity or relationship of these designations. For clinical and marketing purposes, it is best to rely on the current documentation for the specific batch of product, which states which strain (or complex of strains) is actually used today.

3. Patent Protection

A patent is a legal document describing a technical solution and granting its author exclusive rights; a patent by itself **is not a clinical trial and does not prove therapeutic efficacy**. Nevertheless, the patent materials for “Maxilin” contain a detailed technical description of the production method and claimed areas of application worth examining closely.

3.1. Eurasian Patent No. 014227

The patent, issued by the Eurasian Patent Organization (EAPO), is titled “**Method for producing a fermented-milk product and method for correcting microflora in the human and animal body.**”

Review of prior art. The section of the patent devoted to prior solutions lists more than ten previously known methods of producing fermented-milk and probiotic products (based on various strains of acidophilic and bifidobacteria, with additions of wormwood, cedar meal, sea kale, quail eggs, and others) and points to a common shortcoming: **none of them provided sufficient efficacy against dysbacteriosis** and/or had a short shelf life due to increasing acidity of the medium.

Substance of the invention. The claimed technical result is an increase in the shelf life of the fermented-milk product to 3 months and improved taste properties through reduced acidity of the medium (kept within 70–200 °T), achieved by adding egg melange (0.5% of the volume of milk).

Production method (per the patent description):

1. Mixing skim or whole milk with egg melange (0.5% of volume).
2. Sterilizing the mixture under 0.8–1.8 atm pressure for 25–30 minutes.
3. Cooling to 30–37 °C.
4. Introducing the *Lactobacillus acidophilus*-AG/17-666 strain.
5. Incubating in a thermostat at 37–40 °C for 16–18 hours (the resulting curd should be cream-colored and free of gas bubbles).
6. For long-term storage — spray drying at an inlet temperature of 137–140 °C and outlet temperature of 66–75 °C.

Claimed properties of the product (patent wording): resistance to antibiotics; antagonistic activity against putrefactive, pyogenic, and a number of pathogenic bacteria; correction of microflora of the intestine, reproductive organs (vagina, uterus), oral, conjunctival, and nasal cavities, wound cavities; regulation of peristalsis; improvement of metabolic processes; anti-inflammatory and regenerative action.

Claimed dosages (invention claims, items 4–14 of the patent) — presented here as a historical technical document:

Application	Species / age	Dose	Regimen
GI-tract microflora correction	calves	30–250 mL/kg	1–3 times/day, 5–70 days

Application	Species / age	Dose	Regimen
	piglets	1-20 mL/kg	1-3 times/day, 3-15 days
	dogs, fur-bearing animals	0.5-20.0 mL/kg	1-3 times/day, 3 days
	poultry	0.01-0.2 mL/kg	3 times/day, 40-45 days
	fish	2.5 mL per 120 head	once/day, 5 days, 5-6 cycles per season
	children	10-100 mL (by age)	once/day, 3-5 days
	adults	100-200 mL	2-3 times/day, 2-3 days
Uterine/vaginal microflora correction	cows	300-500 mL	2 times/day, 3 days
	sows women	150-200 mL 1-50 mL	2 times/day, 3 days 1-2 times/day for 2-3 hours, 5-7 days
Oral cavity (stomatitis)	calves	10-30 mL	3 times/day, 3 days
	children / adults	10-20 / 20-40 mL	3 times/day, 3-5 days
Conjunctival cavity	animals / children / adults	0.5-1% solution	2-3 times/day, 5-7 days
Wound cavity	as indicated	cleaning and treatment with the product	until healed

3.2. Kazakhstan Patent No. 14850

A certificate from the Committee on Intellectual Property Rights of the Ministry of Justice of the Republic of Kazakhstan confirms that **Grigory Ivanovich Miroshnikov** and **Alexey Ivanovich Gulyaev** are the authors of invention No. 14850 — “**Method for producing a fermented-milk product, method for correcting microflora of non-sterile cavities of the body.**” The patent holder is Gulyaev A.I.; application No. 2004/0388.1 was filed on 19.03.2004. This patent uses the *Lactobacillus acidophilus*-13 strain, No. VKPM 2585.

4. Trademark Registration

The Republican State Enterprise “National Institute of Intellectual Property” (NIIS, Kazakhstan) issued a favorable expert opinion on application No. 27819 (filed 02.07.2004) for registration of a trademark in the name of LLP “**MAX-IGM**” — for:

- **NCL Class 5** — enzyme preparations for veterinary and medical purposes; dietetic beverages and substances; milk ferments for pharmaceutical purposes; food for babies; feed and food supplements for medical purposes; cultures of microorganisms for medical or veterinary use; dietetic food products;
- **NCL Class 29** — milk and dairy products;
- **NCL Class 35** — advertising; public-opinion and market research; promotion and supply services for third parties.

5. Proposed Mechanism of Action

The materials (primarily the developer interview and the accompanying popular-science brochure) describe “Maxilin’s” mechanism of action in the language of **intestinal ecology** rather than simple bacterial delivery:

1. **Direct microbial antagonism.** The strain is claimed to be active against putrefactive and pyogenic microflora and a number of pathogenic bacteria (Salmonella, staphylococci, Proteus, Pseudomonas aeruginosa — per the clinical-use instructions).
2. **Environmental modification.** Byproducts of lactic-acid bacteria metabolism (primarily lactic acid) create an environment unfavorable to putrefactive and pathogenic microorganisms.
3. **Occupation of ecological niche.** Per the description, the bacterium attaches to intestinal villi (“cumulative effect”), physically occupying space that might otherwise be taken up by undesirable microflora.

Patent and clinical documents describe this as the preparation’s ability to “**correct**” **microflora** of the intestine, reproductive organs, oral, conjunctival, and nasal cavities, and wound surfaces; to regulate peristalsis; and to exert anti-inflammatory and regenerative action.

Separately, the documents emphasize a link between gut microflora and the immune system: the intestinal lining is treated as a large surface of contact between the body and the external environment, and a healthy microbial community there is presented as one factor supporting immune response and overall metabolism.

6. Antibiotic Resistance: What It Means and What It Doesn't

One of the key claimed features of the strain is its ability to **remain viable and continue colonizing the intestine even during antibiotic treatment**, whereas most ordinary probiotic cultures die off under these conditions. This property is discussed in detail across the patents, clinical-use instructions, and the independent publication (Section 7).

It is important to understand the precise meaning of this claim:

- It refers to the resistance of **this specific strain** to **specific** antibiotics tested under specific conditions (the clinical-use instructions list streptomycin, monomycin, neomycin, levomycetin, and gentamicin).
- It does **not** mean that the probiotic replaces an antibiotic, strengthens its action in the human body, or “works like an antibiotic.”
- The practical implication claimed in the documents: the product can be used **concurrently with antibiotic therapy** to restore microflora, without waiting for the course of treatment to end — this is precisely what distinguishes it from ordinary lactic-acid cultures, which die off under these conditions.

7. Independent Scientific Publication

The strongest source in this dossier is an article independently indexed in **PubMed** (U.S. National Library of Medicine), not affiliated with the manufacturer:

Pichkhadze G.M., Rusanov V.P., Novoselov V.E. The antagonistic activity of the eubiotic Maxilin towards wound infection and its effect on the antibiotic resistance of microorganisms. *Stomatologiia (Moskva)*. 2000;79(4):22-27. **PMID: 10961107.**

What the publication shows:

1. **Antagonistic activity against selected microorganisms.** The authors report growth inhibition of the microorganisms examined — *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Escherichia coli*, and *Candida albicans*. According to the abstract, the strongest effect was observed against *Candida*, followed by *P. aeruginosa*, *S. aureus*, and *E. coli*.
2. **Changes in antibiotic sensitivity.** Under the study conditions, use of “Maxilin” was associated with a change in the epidemiological significance of the tested pathogenic strains and increased sensitivity to the antibiotics studied after several days.
3. **What the publication does not prove.** These findings do not mean that “Maxilin” is an antibiotic, that it strengthens antibiotic action in the human body, or that it cures infections in every patient. The study examined specific microbial strains under specific experimental/clinical conditions in 2000.

Limitation. This is a 2000 publication in a dental-medicine journal (*Stomatologiia*), concerned with wound infections in dental practice. It should not automatically be extended to every component of today’s commercial formula.

8. Official Clinical Instructions and Opinions (Kazakhstan)

A number of official documents, approved by Kazakhstani government bodies and professional associations, describe the clinical use of “Maxilin.” These are regulatory documents from a specific historical period — their dosages are relevant to the product form and period to which they belong.

8.1. Clinical-Use Instructions for Dysbacteriosis and GI-Tract Disorders

Developed by the Alma-Ata State Medical Institute (authors: T.A. Kharitonova, G.A. Gulyaeva), approved by the Pharmacological Commission of the Ministry of Health of the Republic of Kazakhstan (1993).

- **Composition:** pure culture of acidophilic bacteria, strain 2585; cream-colored milk curd.
- **Form of release:** hermetically sealed glass bottles of 100–500 mL; stored at 5–10 °C; shelf life 10 days from manufacture if the packaging is unopened.
- **Pharmacological properties:** resistance to antibiotics (streptomycin, monomycin, neomycin, levomycetin, gentamicin); antagonistic activity against putrefactive, pyogenic, and a number of pathogenic bacteria (Salmonella, staphylococci, Proteus, Pseudomonas aeruginosa); normalization of gut microflora; regulation of peristalsis; improved absorption; anti-inflammatory action.
- **Dosing** (orally, 30 minutes before meals, 1–3 times per day):

Age	Dose
under 6 months	10–30 mL
from 12 months	50–60 mL
1–5 years	80–120 mL
over 8 years	120–200 mL
adults	200–400 mL

Duration of treatment — from 10 days to 2 months or more, until recovery; the stated daily dose may be split into 3–5 doses. The instructions list no side effects or contraindications.

8.2. Instructions for Use in Vaginitis and Gynecological Disorders

Also developed by the Alma-Ata State Medical Institute (Gulyaeva G.A., Kharitonova T.A.), registered 1994.

- **Indications:** prevention and treatment of vaginitis; retains its preventive and therapeutic effect even when administered together with antibiotics or in the presence of residual antibiotics in the body.
- **Dosing:** in the absence of Döderlein’s lactobacilli in the vagina and where normalization of vaginal microflora is needed — administration of the preparation into the vagina at a dose of 4–50 mL, or tampons soaked in the preparation for 2–3 hours once daily; course of 5–10 days.

- The instructions list no side effects or contraindications; the product is noted as environmentally clean.

8.3. Opinion of the Kazakhstan Association of Nutritionists, Gastroenterologists, and Endoscopists

The document, “On the Use of the Domestic Functional Probiotic Product ‘Maxilin’ for the Purpose of Normalizing Gut Microbiota,” was approved by the professional association and signed by its president, a Doctor of Medical Sciences and Professor.

- **Product definition:** a functional probiotic fermented-milk product enriched with acidophilic lactobacilli (strain designation “2585-666”).
- **Claimed indications:** quantitative and qualitative disturbances of gut microflora (small intestinal bacterial overgrowth) associated with chronic GI-tract disorders — post-cholecystectomy states, chronic pancreatitis, intestinal toxic-allergic reactions, functional disorders (irritable bowel syndrome, biliary dysfunction), metabolic disorders (hepatic steatosis, steatohepatitis).
- **Composition:** B vitamins (thiamine, riboflavin, pyridoxine, biotin), vitamin C, unsaturated fatty acids, easily absorbed polypeptides containing a full set of essential amino acids.
- **Dosing** (orally, 1-3 times per day before meals):

Age	Dose
1-5 years	60-120 mL
over 5 years	120-150 mL
adults	150-250 mL

Duration of use is not limited. Stored at 2-10 °C; shelf life 15 days.

8.4. Implementation and Clinical Observation Acts

Several acts, signed jointly by staff of Kazakhstani medical institutions and the developers (T.A. Kharitonova, G.A. Gulyaeva, Alma-Ata State Medical Institute), record the results of practical use of the preparation:

- **Republican Polyclinic of the Military Medical Service of the KNB of the Republic of Kazakhstan (1994).** Use for genital infection and dysbacteriosis under bacteriological monitoring. Result: improved well-being; disappearance of discharge, itching, hyperemia, and edema of the vaginal and cervical mucosa; normalization of cervical mucus neutrophil function by day 5-7; disappearance of putrefactive and pyogenic flora on vaginal smear, with the appearance of Döderlein’s bacilli.
- **1st Polyclinic Association, Almaty.** Use for dysbacteriosis (April-June) under bacteriological monitoring of stool. Result: improved well-being and digestion; significant reduction in lactose-negative coliform bacteria; appearance of bifidobacteria and acidophilic bacilli.

- **Institute of Pediatrics.** Use in children for intestinal dysbacteriosis, chronic colitis, and secondary malabsorption syndrome (October–December). Result similar to the above — improved well-being and digestion, normalized bacteriological stool profile.
- **Kazakh Research Institute of Cardiology (implementation act, 1977).** Methodological recommendations, “Biological Preparations in Treatment...,” implemented for the prevention and dietary treatment of GI-tract disorders — one of the earliest documents in this collected dossier, attesting to a long history of clinical use of the culture.

9. Clinical Study by the Kazakh National Medical University

The most methodologically detailed clinical document among the supplied materials is a study conducted at the microbiology laboratory of the **S.D. Asfendiyarov Kazakh National Medical University** (Almaty): *“Use of the Domestic Eubiotic ‘Maxilin’ for Correction of Gastrointestinal Microflora.”*

9.1. Rationale and Methodology

The authors note that in dysbacteriosis, the most sensitive members of the microflora — lactic-acid bacteria, cellulolytic bacteria, and coliform bacteria — are the first to die off, disrupting the stable ecological system of the microbiocenosis. The study’s aim was to evaluate the effectiveness of the eubiotic “Maxilin” (a pure culture of acidophilic bacteria of strain 2585, grown on skim milk) for correcting GI-tract microflora.

Study design:

- Bacteriological examination of stool from **8 adult patients with dysbacteriosis** compared with a control group of **healthy volunteers** of the same age — to describe the normal and disturbed microbial “landscape” of the intestine.
- Observation of **30 patients** with a clinical diagnosis of “chronic gastritis complicated by dysbacteriosis.” Regimen: **100 mL 3 times per day, 30 minutes before meals, for 4 weeks**. Bacteriological examination was conducted before and after the course.
- Methodology: the Epstein-Litvak technique, with dysbacteriosis severity classified according to A.F. Bilibin. Aerobic and anaerobic cellulolytic bacteria were isolated on Hutchinson’s, SZhN, and semi-liquid cellulose agar media; lactic-acid bacteria on MRS media, sterile skim milk, and Rogosa agar; bifidobacteria on Blaurock medium; preparations were Gram-stained.

9.2. Results

Healthy volunteers: lactic-acid flora was consistently present in stool; lactic-acid cocci were found in 20% of subjects, while bifidobacteria and acidophilic bacteria were found in 100%. Among cellulolytic bacteria, thermophilic clostridia (12%), cellulolytic cocci (18%), Cellulomonas-genus bacteria (36%), and cellulolytic mycobacteria (4%) were identified.

Patients with intestinal dysbacteriosis (before treatment): bifidobacteria were noted in only 62.5%, lactic-acid cocci in 12.5%, and acidophilic bacilli in 25%; cellulolytic bacteria were found substantially less often. Dysbacteriosis was associated with *Pseudomonas aeruginosa* in 26.25% of patients, with *Candida*-genus fungi in 11.25%, with a combination of *Pseudomonas aeruginosa*, *Proteus*, and *Candida* fungi in 7.5%, and with *Proteus* alone in 2.5%. All subjects showed elevated counts of coliform bacteria with weakly expressed enzymatic properties.

Patients with chronic gastritis complicated by dysbacteriosis (n=30), before treatment with “Maxilin”: pronounced associated dysbacteriosis (staphylococci,

Proteus, lactose-negative E. coli, yeast-like Candida fungi); cellulolytic bacteria were not detected, and lactic-acid microbes were completely absent. Clinically — loose, foul-smelling stool and dyspeptic symptoms.

After a 4-week course of “Maxilin”: pronounced dysbacteriosis persisted in only 5 of 30 patients. In most patients, the ratio of microbial flora normalized: lactic-acid and bifidobacteria appeared, as did cellulolytic flora. Clinically — normalization of stool, with dyspeptic symptoms resolving by the end of the course.

9.3. Authors’ Conclusions

- The death of lactic-acid and cellulolytic bacteria in the GI tract is identified as an important factor in the onset of dysbacteriosis.
- The absence of cellulolytic bacteria in the GI tract may serve as one indicator of intestinal dysbacteriosis.
- The possibility and effectiveness of correcting resident microflora of non-sterile body cavities by colonizing them with a pure culture of acidophilic bacteria from the eubiotic “Maxilin” is demonstrated.

The article draws on 7 literature sources, including work on lactobacillus cytoadhesion, the protective effect of lactobacilli (including a 1987 Japanese study in the *Journal of Clinical Microbiology*), and methodological guidelines for diagnosing dysbacteriosis (Epstein-Litvak, Vilshanskaya, 1977; Bilibin, 1970; Grebnev, Myagkova, 1994; Pinegin, Maltsev, Korshunov, 1984).

How to read this section. This is an open (before/after) clinical observation conducted at a university laboratory, without placebo-control or randomization as described. It represents a substantive and methodologically described clinical observation, but its design rigor differs from that of a modern randomized controlled trial.

10. Veterinary and Agricultural Observations

A significant portion of the supplied materials concerns use of the culture in livestock and poultry farming — this is the area with the largest volume of quantitative data.

10.1. Examples From Patent No. 014227

The patent provides detailed examples of the product's use for correcting microflora in various animal species and in humans (full data in Section 3.1, dosage table). The most illustrative example is a controlled comparison in calves:

- **Group 1 (25 head):** antibiotics + the claimed fermented-milk product (given orally on an escalating schedule from the first days of life). Result: no mortality; diarrhea resolved in 100% of animals (25 of 25).
- **Group 2 (25 head):** antibiotics only, without the fermented-milk product. Result: 12% mortality (3 head); diarrhea resolved in only 60% (15 of 25).

Similar examples are given for piglets (normalized GI function, no signs of diarrhea), dogs and fur-bearing animals (restored GI function), poultry (restored GI function; in the experimental group of chicks that received the dry product with feed, average carcass weight was ~1,190 g versus ~1,082 g in the control group, which received antibiotics and formalin), as well as for correcting uterine and vaginal microflora in cows and sows, oral cavity, conjunctiva, and healing of purulent wounds in animals, and fish (treatment of “red disease” in fish).

10.2. Production Reports From Poultry Operations

JSC “Almaty Kus.” A report on wide-scale production use of the preparation describes an initial trial in two poultry houses affected by colibacillosis and coccidiosis (mortality of 300–350 head/day), where after 4 days of applying the preparation with feed (~10 g per kg of bird weight) mortality dropped to approximately 40–90 head/day. The preparation was then rolled out across the entire operation (~10 kg of preparation per ton of compound feed, up to a 40-day course, without the antibiotic “Baytril”). Recorded effects: birds stopped falling on their legs; flock survival improved by 4–5%; hatch rate improved; egg production increased in the egg-laying flock; eggshells became stronger due to improved calcium metabolism. The Nutrition Academy of the Republic of Kazakhstan issued a certificate of non-toxicity and non-pathogenicity for strain 13 No. VKPM 2585 and classified the meat of poultry receiving the preparation as high-quality and environmentally clean. The commission at JSC “Almaty Kus” confirmed the reliability of the data, recommended practical use in poultry farming, and recorded an economic effect above plan from October 2006.

JSC “Alel-Agro.” A similar report from October 2006 describes use of the preparation for prevention and treatment of colibacillosis, coccidiosis, salmonellosis, and to boost poultry immunity. It notes improved flock survival (especially notable in poultry houses with difficult microclimates — up to 4–5%), reduced coccidiosis incidence when combined with antibiotics, suppression of mold growth in feed, improved hatch and egg-laying rates, and stronger eggshells. The company's commission likewise

confirmed the reliability of the data and recommended the preparation for practical use.

10.3. Veterinary Act From the Alma-Ata Zooveterinary Institute (1985-1987)

A document prepared by the Department of Microbiology and Virology of the Alma-Ata Zooveterinary Institute describes production, organized at the “Volynsky” farm complex, of a preparation from antibiotic-resistant acidophilic bacteria (strain 2585), and its use in 1985–1987 for treating diarrhea and dysbacteriosis in piglets, as well as metritis in sows. According to the act, across a large population of piglets and sows, the preparation noticeably reduced piglet mortality from diarrhea and dysbacteriosis and increased weight gain during rearing; use of antibiotics for treating sow metritis was replaced with use of the preparation. The act’s authors note that strain 2585 establishes itself better in piglets and is a more active antagonist of *Pseudomonas aeruginosa* compared with the previously used ABK and SBK (acidophilic and dry-broth cultures).

Some numerical figures in this act are difficult to read on the original scan (a document from 1985–1987), so the specific percentages here are presented with caution and should not be quoted as exact without checking against the original act.

11. Laboratory Compositional Analysis (Test Protocol No. FKh/26, 2025)

The accredited physicochemical testing laboratory of LLP “Scientific and Production Enterprise ‘Apitigen’ ” (Almaty region) conducted control testing of a sample of “**Maxilin Liquid**” (manufacture date 01.2025, shelf life until 03.2025) for compliance with Technical Regulation TR CU 033/2013, “On the Safety of Milk and Dairy Products.”

Nutritional and energy value (per 100 mL):

Indicator	Value	Method (standard)
Fat content	0.15%	ST RK 1483-2005
Protein content	5.6 g	GOST 30648.2-99
Moisture content	90%	GOST 3626-73
Carbohydrate content	2.3 g	GOST 3628-78
Vitamin C	~6.8 mg	GOST 30627-98 (HPLC-DAD)
Energy value	32.95 kcal	—

Macro- and micronutrients (per 100 mL, GOST 30178-96):

Element	Value
Potassium	362.8 mg
Calcium	~182.5 mg
Magnesium	194.2 mg
Phosphorus	(illegible on scan)
Zinc	0.908 mg
Copper	0.024 mg
Iron	0.129 mg
Manganese	0.008 mg
Selenium	0.003 mg

Vitamin C was determined by high-performance liquid chromatography with diode-array detection (HPLC-DAD); the corresponding chromatogram is included in the protocol.

Caveat. These values apply to a specific sample and manufacture date (January 2025) of the liquid form of the product. Composition may vary from batch to batch and between forms (e.g., a dry powdered product vs. a liquid fermented-milk product); for current data on a specific purchased batch, refer to the label and, if needed, a fresh test protocol.

12. Conformity Certification

The competent conformity-assessment body “KAZEXPOAUDIT” (Almaty) has issued conformity certificates for the manufacturer’s fermented-milk product line (in the supplied materials — a certificate for “Alel-Max fermented-milk products”) confirming compliance with Kazakhstani Technical Regulations KR TR No. 277/2008 and KR TR No. 230/2008, GOST 3626-73, and the sanitary rules “Sut” (No. 117-2010). Such certificates confirm that the product complies with Kazakhstan’s established dairy-product safety requirements and are periodically reissued/renewed.

13. What the Independent Popular-Science Microbiome Book Shows

In addition to the primary documents, the supplied materials include a separate popular-science book, **“The Strength of the Gut Microbiome”** (ENERGYMAX GROUP edition), written with an explicit emphasis on the same evidence-separation principle underlying this dossier. It directly tells the reader:

- the microbiome is a real and important biological ecosystem;
- probiotic effects are **strain-specific** — a high CFU count on the package alone does not guarantee an outcome without strain-specific evidence;
- “Maxilin” and strain No. 2585 have a documented scientific publication (Section 7 of this dossier);
- personal user stories should remain clearly labeled as personal observations, not as proof of treatment for a specific disease.

The book explicitly cautions that a strain’s resistance to specific antibiotics in a study does not mean antibiotics “won’t work” on a person, and does not make the probiotic an antibiotic — a formulation fully consistent with Section 6 of this document.

14. Evidence Hierarchy

Level	Source	What it provides	How to use it
1	Publication PMID 10961107 (<i>Stomatologiia</i> , 2000)	Independently indexed scientific confirmation of antagonistic activity of the strain against several microorganisms	The most reliable confirmation of a specific, narrow set of effects
2	Patents (EAPO No. 014227, RK No. 14850); official instructions approved by the Pharmacological Commission of the Ministry of Health of RK; accredited laboratory protocols; conformity certificates	Legally and regulatorily documented technical and clinical descriptions	A good source of facts about composition, production method, and claimed indications; does not replace a clinical trial
3	KazNMU clinical study; acts from medical and veterinary institutions; poultry-farm production reports	Documented before/after observations in real groups of people and animals	Substantive but predominantly uncontrolled observational data
4	Developer interview; brand brochure; popular-science book	History of development, proposed mechanism of action, personal experience	Valuable context and explanation of “how it works,” but not scientific proof on its own
5	Marketing materials	Product promotion	Should not be presented as independently proven scientific fact

15. Limitations and Correct Interpretation

- **A patent is not proven efficacy.** A patent describes a technical solution and confirms priority of invention; examination by a patent office is not equivalent to an independent clinical trial.
- **Historical dosages are time-bound.** The doses and regimens found in the 1993–2006 patents and instructions relate to specific product forms and concentrations from that period. The current instructions and labeling for today’s product may differ — and should be the primary reference.
- **The interview is personal testimony.** G.I. Miroshnikov’s account conveys his own memories, observations, and opinions (including his personal experience of recovery after participating in the Chernobyl cleanup effort). This is valuable historical and personal context, but it does not substitute for independent verification of historical details.
- **One type of resistance is not a universal property.** The strain’s resistance to the listed antibiotics under the described conditions does not imply resistance to all antibiotics, and does not mean the strain “neutralizes” an antibiotic in the human body.
- **Observational data is not a randomized trial.** The clinical acts and production reports collected in this dossier are, for the most part, open observations without randomized controls or blinding; they are informative but methodologically not equivalent to modern randomized controlled trials.
- This document does not replace consultation with a physician, pediatrician, gynecologist, or veterinary professional and should not be used as the sole basis for treatment decisions.

16. Conclusion

The materials gathered in this dossier depict “Maxilin” as a product with an unusually long history — from a line of research on acidophilic lactobacilli tied to Soviet and post-Soviet Kazakhstani science in the 1970s–80s, through to modern laboratory protocols from 2025. The strengths of the evidence base: an independent peer-reviewed publication naming the product by name; two patents with detailed technical descriptions of the production method; several official clinical instructions approved by a state pharmacological commission; a detailed university clinical observation with a clear methodology; a substantial body of veterinary production data.

Limitations should also be stated plainly: some historical documents have poor scan quality with illegible fragments; most clinical observations are not randomized; claims about the origin and early history rely on an interview and brand materials rather than independently verified historiography; the modern commercial formula should be checked against its own current documentation, not only against historical sources.

The most defensible conclusion: **gut microflora is a real and important biological system; probiotic effects are strain-specific; “Maxilin” and its associated strain No. 2585 have a documented scientific publication and a detailed regulatory history in Kazakhstan; personal and historical testimony should remain clearly labeled as such.**

17. Sources Used in Preparing This Document

1. Eurasian Patent No. 014227. "Method for producing a fermented-milk product and method for correcting microflora in the human and animal body." Eurasian Patent Organization (EAPO).
2. Kazakhstan Patent No. 14850. "Method for producing a fermented-milk product, method for correcting microflora of non-sterile cavities of the body." Authors: Miroshnikov G.I., Gulyaev A.I. Application No. 2004/0388.1, filed 19.03.2004.
3. Expert opinion on trademark registration No. 27819 (applicant — LLP "MAX-IGM"). Republican State Enterprise "National Institute of Intellectual Property," 02.07.2004.
4. Clinical-use instructions for Maxilin in dysbacteriosis and GI-tract disorders. Alma-Ata State Medical Institute (Kharitonova T.A., Gulyaeva G.A.), approved by the Pharmacological Commission of the Ministry of Health of RK, 1993.
5. Instructions for use of Maxilin for the treatment and prevention of vaginitis and gynecological disorders. Alma-Ata State Medical Institute (Gulyaeva G.A., Kharitonova T.A.), registered 1994.
6. "On the Use of the Domestic Functional Probiotic Product 'Maxilin' for the Purpose of Normalizing Gut Microbiota." Kazakhstan Association of Nutritionists, Gastroenterologists, and Endoscopists.
7. Implementation and clinical observation acts: Republican Polyclinic of the Military Medical Service of the KNB of RK (1994); 1st Polyclinic Association, Almaty; Institute of Pediatrics; Kazakh Research Institute of Cardiology (1977).
8. "Use of the Domestic Eubiotic 'Maxilin' for Correction of Gastrointestinal Microflora." S.D. Asfendiyarov Kazakh National Medical University, microbiology laboratory.
9. Veterinary act from the Department of Microbiology and Virology of the Alma-Ata Zooveterinary Institute ("Volynsky" farm complex, 1985-1987).
10. Reports on wide-scale production use of "Maxilin": JSC "Almaty Kus"; JSC "Alel-Agro."
11. Test Protocol No. FKk/26, dated 03.03.2025. Physicochemical Testing Methods Laboratory, LLP SPE "Aptigen" (Almaty region).
12. Conformity certificates issued by LLP "KAZEXPOAUDIT" for fermented-milk products.
13. Pichkhadze G.M., Rusanov V.P., Novoselov V.E. The antagonistic activity of the eubiotic Maxilin towards wound infection and its effect on the antibiotic resistance of microorganisms. *Stomatologiya (Moskva)*. 2000;79(4):22-27. PMID: 10961107.
14. Interview with microbiologist G.I. Miroshnikov (consolidated interview summary prepared for practitioners).
15. "The Strength of the Gut Microbiome." Popular-science book about the microbiome, strain No. 2585, and the "Maxilin" product. ENERGYMAX GROUP edition.
16. Transcript of the conversation "Maxilin: Gut Dysbiosis & Antibiotic-Resistant Probiotic" — used as a source for historical narrative (identified within the transcript itself as testimony/ account requiring independent verification).